CHAPTER IV. *Infectious Diseases*

A. Overview

Infectious Diseases covers a wide range of communicable diseases that are tracked at national and state levels because of possible widespread outbreaks, risk to specific populations, and serious long-term health complications as a consequences of infection.

1. What are infectious diseases? Infectious diseases are human illnesses caused by microorganisms (microscopic life forms) or their poisonous byproducts. Disease-causing microorganisms reproduce in humans and have evolved to live in all human environments. So, we are rarely far away from dangerous disease agents and the illnesses they can cause.

Several types of microorganisms can cause infectious diseases:

- Viruses
- Bacteria and bacteria-like organisms
- Fungi
- Protozoa
- Parasites
- Microscopic worms
- Rickettsia

These microorganisms produce a vast array of illnesses — from the short-lived, minor nuisances of the common cold or stomach "flu" to fatal episodes of malaria, cholera, tuberculosis, and emergent or re-emergent infections.

2. What Are the Main Ways that Infectious Diseases Spread? Some disease-carrying microorganisms live only in humans. As they reproduce, they can spread from person to person *directly* through sneezing, coughing, touching, or sexual activity. Microorganisms can also spread *indirectly* when an infected person contaminates an environmental surface or produce (such as food) and then other people touch the surface or ingest the product. Many disease-causing microorganisms also live in animals or other parts of the environment. These microscopic disease agents can be spread to humans through contaminated food, beverages, surfaces, or objects. Some can be breathed in from the air, or transmitted into the blood by an insect bite or the bite of a sick animal.

Infectious diseases are categorized and monitored based on:

- their ability to spread quickly, with containment being difficult;
- seriousness of the short and/or long-term consequences of acquiring the disease;
- the fact that the disease may be untreatable and/or fatal once acquired.

Therefore, most of the focus in the management of infectious disease is its prevention and detection. When treatment is available, successful outcomes often depend on how quickly

detection occurs. In cases where there are no successful treatments (such as AIDS), even more emphasis must be placed on prevention.

3. What are emerging diseases? Emerging infectious diseases are those that have appeared in a population within the past two decades or threaten to increase in the near future. "New" infectious diseases can emerge from genetic changes in existing organisms and appear suddenly in new populations. At least 30 new disease agents have been identified over the past two decades and new agents are being added constantly. Infectious diseases viewed as afflictions of a bygone era are also making a comeback. Termed "re-emerging infectious diseases", these are illnesses from well-understood microorganisms that were once under control but are now resistant to common antimicrobial drugs or have gained new footholds in the population.

4. What are the key issues and trends in Infectious Diseases? In the past, physical, political and cultural barriers prevented or slowed the spread of infectious diseases. Of course, these barriers no longer exist because of today's technology, global economy, and air travel. Other natural barriers, like tropical forests and other once-isolated areas of the world, are being eradicated, exposing the civilized world to serious diseases it was never exposed to. Clearly, there are serious concerns about the early detection and containment of serious infectious diseases due to its potential rapid spread.

Key issues in managing infectious diseases are:

- adequate systems for the earliest detection and containment of new or re-emerging diseases;
- a healthcare delivery system that can effectively treat and provide follow-up care; and
- educational activities that can support preventive efforts, especially for diseases that have severe short and long-term consequences.

5. Understanding of Community Roles in Controlling Infectious Diseases. Advances in hygiene, immunizations, and antibiotics are important tools in the battle against emerging infectious diseases. But they all hinge on community partnerships needed to launch and sustain an effective, wide-ranging, and long-term fight. Just as every community is expected to have a well-functioning, established fire detection and response system, so must every community have a well functioning, proactive infectious disease prevention and control capabilities to protect public safety and health.

- Communities need sound infrastructures to ensure safe water supplies, community sanitation, and restaurant and fold-service inspection systems. Public health programs need well-trained experts and adequate resources to detect and investigate unusual clusters of infectious disease.

- Physicians and laboratories must share infectious disease information with public health officials who are looking for unusual disease clusters and patterns. Physicians need up-to-date information on the frequency of antibiotic-resistant microorganisms in the community and must adjust their prescribing practices accordingly.

- Hospitals must use protective precautions when caring for persons with infectious diseases so they do not spread to others. Blood banks must look for potentially dangerous organisms in blood that is used for transfusions.

- Child-care centers and schools must enforce immunization requirements to prevent childhood infectious diseases from spreading in the community. Schools must teach and model protective measures so that children will avoid infectious diseases now and when they are older. The growth of elder care centers, assisted living facilities, and senior communities will require similar procedures focused on infectious diseases to which the aged are particularly susceptible and vulnerable.

6. Role of Health Professionals. Physicians are a fundamental part of the disease surveillance system and are the key element in limiting the size of outbreaks. They must recognize infectious diseases and report notifiable diseases to the public health authorities. Physicians directly impact performance through appropriate drug prescription practices, immunizations, and necessary patient education.

Nurses are critical in their roles in physician offices, hospitals and other health care settings. They often have the most contact with patients, and are in the best position to provide education and enforcement of procedures to prevent nosocomial infections.

Dentists, physiotherapists and other health professionals who treat patients should follow strict hygienic procedures when dealing with patients. They should also be alert to the possibility of unusual symptoms in patients and reporting them to their physicians.

Public Health personnel must ensure that all relevant infectious diseases are reported and that proper procedures are in place to respond promptly and appropriately to control their spread. This means there must be legislation in place requiring notification, that physicians (as well as hospitals and laboratories) are aware of their reporting responsibilities — through medical education, continuing medical education, or newsletters — and that reporting is done conscientiously.

Public health personnel should prepare guidelines on how infectious diseases should be dealt with to reduce the public health threat. Implementation should include a laboratory network to confirm diagnosis, prompt communication between laboratory and public health personnel, and sufficiently trained human resources to deal effectively with infectious disease threats.

7. Disease Detection and Tracking. In the United States, data on reportable communicable disease are monitored by state health departments and are forwarded to the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia for national tracking and redistribution. In Hawaii, the State Department of Health Communicable Disease Division publishes a bi-monthly report reflecting summary tracking of certain diseases somewhat similar to the CDC. Some diseases are reported primarily due to concerns occurring locally.

Healthcare institutions also track infectious disease rates occurring among their health workers and patients (also known as nosocomial infections). Tracking of infectious disease rates is handled differently at each facility and is reflective of their specific clinician concerns

and patient mix. Because of the emphasis on community health status, tracking of nosocomial infections will not be included in this chapter.

The following is an attempt to incorporate the above concepts as well as caveats to providing some realistic measurements for health care status of our community.

B. Measures/Indicators

Measurements of quality will focus primarily on the various components of disease management—prevention, detection, treatment and follow-up. Unlike other chapters, infectious diseases contain many categories and types of illnesses linked only by the underlying concern for their emergence and spread through the population. Therefore, the few that are selected must have a strong relationship to the indicators we are looking to measure: Access, Quality and Cost-Effectiveness.

The monitors chosen were selected in consideration of the following:

- Diseases that are fairly common, treatable, often reoccur seasonally, and that affect a large proportion of the population. Because they are routinely present, their prevention and detection are a good indicator of the existing healthcare systems in place. Emphasis is more on containment and management.
- Diseases that have a significant short or long-term effect on individuals if acquired and at a significant cost to society. These diseases have a major impact on society even though the total number of individuals may be small in comparison to other infectious diseases (for example, chicken pox versus AIDS).
- Activities considered to address the prevention and detection.
- Indicators that were identified by the Federal and State health goals (Healthy People 2000 and Healthy Hawai`i 2000).
- Reliable data sources available for each indicator. However, indicators are also selected which have no existing data sources. It is hoped that by including them that such data sources will be established in the near future.

1. Process Measures

Measure Number	Monitor	Definition	Guideline Healthy People 2000, Healthy Hawaii 2000, DOH (HH 2000)	Hawaii (1998) Rate per 100,000/ No. Cases	Hawaii Experience 5 yr. avg. / 5 year median Dept of Health, CDC	Cross-reference
IDP-1	Basic Immunizations[a]	Through age 2	90% (95%)	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC	*Maternal, Infant and Child Health*
IDP-2	Basic Immunizations[a]	In child care facilities	95%	To Be Updated By SHCC's PDC	To Be SHCC's PDC	*Maternal, Infant and Child Health*
IDP-3	Immunization of High Risk Population (chronically ill or elderly) for Pneumonia & Flu	Institutional	80% (85%) of high-risk population	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC	*Diabetes and Other Chronic Disabling Diseases*
IDP-4	Immunization of High Risk (chronically ill or elderly) for Pneumonia & Flu	Non-institutional	60%	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC	*Diabetes and Other Chronic Disabling Diseases*
IDP-5	Education on STD	Students who received HIV & other STD information	Increase to at least 90%	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC	*Maternal, Infant and Child Health; Dental (Oral) Health*
IDP-6	STD Access[b] of Services Provided	Provider sites[c] with 1° care prevention and referrals for 2°	Increase to be at least 50% of the total	To Be Updated by SHCC's PDC	To Be Updated by SHCC's PDC	

Measure Number	Monitor	Definition	Guideline Healthy People 2000, Healthy Hawaii 2000, DOH (HH 2000)	Hawaii (1998) Rate per 100,000/ No. Cases	Hawaii Experience 5 yr. avg. / 5 year median Dept of Health, CDC	Cross-reference
		prevention services.				
IDP-7	Immunization of High Risk Population for Hepatitis B	Exposed workers	90%	To Be Updated By SHCC's PDC	To Be Updated By SHCC's PDC	

2. Outcome Measures

Measure Number	Monitor	Definition	Guideline Healthy People 2000, Healthy Hawaii 2000, DOH (HH 2000)	Hawaii (1998) Rate per 100,000/ No. Cases	Guideline/ Hawaii Experience 5 yr avg. / 5 year median	Cross-reference
IDO-1	Incidence	Bacterial Meningitis	4.7 per 100,000	.67 / 5	6.7 / 7	

C. Community Specific Issues

Hawaii faces challenges in the area of infectious diseases quite different from other states. Isolation and containment of infectious disease can, to some extent, be effectively managed due to our topography of our island state. Ethnic mix, economic demographics and cultural practices also vary enough from area to area that can produce different outcomes on incidence and outcomes. They also define "communities" which may have their own unique concerns in the areas of infectious diseases. With this in mind, the following are some observations made regarding community-specific issues related to infectious diseases.

- There is a need for more prevention and education for sexually transmitted diseases (STD), with focused activities in the Department of Education curriculum for elementary/middle schools for grades 4-12; general availability of grade-appropriate HIV and STD education.
- Improved access to basic immunizations for childhood diseases for children.
- Improved access to influenza, hepatitis and pneumococcal pneumonia vaccines for high-risk populations such as the elderly and young children.
- There is a high prevalence of tuberculosis due to in-migration and travelers from endemic areas.
- Further study is needed for each island county regarding differences in incidence rates.
- Data collection coordination and improvements are needed among state, local agencies, healthcare providers and health plans.

D. Priorities

1. Access.

- Increase the number of community based facilities to provide outreach
- Provide educational services to resolve language barriers of many ethnic groups
- Address cultural diversity issues
- Provide respite care and screening for adults and children

2. Quality.

- Establish clinical benchmarks for minimum standards for the delivery of care for the prevention, detection, management and follow-up of infectious diseases
- Encourage, support and facilitate clinicians to accurately and promptly meet reporting requirements

3. Costs.

- Provide community-based education as a cost-effective means for prevention and containment of infectious diseases
- Build incentives into community-based delivery systems that emphasize preventive care and proactive management of infectious diseases

NOTES

Hawaii Department of Health, *Updated Objectives and Health Status Indicators for the State of Hawaii, 1998,* published by Healthy Hawaii 2000.

Centers for Disease Control, Website.

Process and Outcomes Measures Charts:

(a) Per Chapter 11-157 of the Hawai`i Administrative Rules, the basic immunization series required by age 2 for preschool entry are: Four (4) doses of diphtheria-tetanus-pertusis + three (3) doses of polio + one (1) dose of measles-mumps-rubella + Haemophilus influenza type b (Hib) (more than one dose of Hib is needed for children less than 15 months of age; the number of doses depends on the age Hib is started and the brand of vaccine use) + three (3) doses of Hepatitis B vaccinations.

(b) "STD Access of Services Provided" means the degree to which an individual can approach, enter, and make use of needed STD services from providers in the community.

(c) "Provider sites" include physician offices, outpatient clinics, hospitals and other health care settings.